## Space Weather Forecast

Issued on Wednesday, 23 February 2022 at 12:28 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Slight chance throughout of Moderate class flares.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Very Low over the past 24 hours, with no significant flares observed. There are three regions on the visible disk, the oldest is progressing across the northwest quadrant of the visible disc and is weak and stable. The two remaining regions in the northeast with the slightly more southerly region considered as the source of a notable far-sided flare and Coronal Mass Ejection (CME) on the 15th Feb, as well as the common class flare which occurred on the 21st.
No Earth-directed CMEs were observed in the available imagery during the past 24 hours.

**Solar Wind / Geomagnetic Activity:** The solar wind declined from elevated to slightly elevated and is currently just below 500 km/s. The total magnetic field strength, has been weak, with no significant deflections in its important north-south component. Resultant geomagnetic activity was Quiet (Kp 0-2).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) has returned to background levels.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Solar activity is expected to be Low or Very Low, with a slight (5-10%) chance of becoming Moderate due to the potential for flaring from the aforementioned region in the northeast.

**Solar Wind / Geomagnetic Activity:** There are no Earth-directed CMEs in the forecast. Solar winds are anticipated to continue slowly declining over the next few days, although a slight increase may occur on day 2 (24 Feb) as a relatively faster solar wind impacts Earth, and on day 1 (23 Feb) a glancing blow from a coronal mass ejection may affect Earth with low confidence. Geomagnetic activity is expected to be mostly Quiet with a Chance (20-50%) of an Active interval, most likely on day 1 or 2 (24 or 25 Feb).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is expected to remain at background, with no solar radiation storms expected through the period.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 10 | 1 | 1 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 5 | 10 | 10 | 10 |
| Very Active | R3 to R5 X | No | 1 | 1 | 1 | 1 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 1 | 1 | 1 | 1 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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